CLAIMS

1.   A method for selecting a modulation and coding scheme (MCS) to be used when sending messages in a wireless communication system, the method

5   comprising:

determining a first set of MCSs, each of which produces a maximum data rate for a first user, in accordance with available resource constraints of the wireless communication system;

forming, for each MCS of the first set, a second set of MCSs

10   that produces the maximum data rate for a second user in accordance with a first residual resource that remains when applying that MCS to the first user, thereby producing a group of second sets of MCSs; and

after producing the group of second sets, selecting, from the first set and for the first user, a first optimal MCS corresponding to one of the group

15   of second sets that allows a highest maximum data rate for the second user.

2. The method of claim 1, further comprising:

selecting the one of the group of second sets that allows the highest maximum data rate for the second user as an optimal second set of MCSs for the second user;

5   forming, for each MCS of the optimal second set, a third set of MCSs that produces the maximum data rate for a third user in accordance with a second residual resource that remains when applying that MCS of the optimal second set to the second user, thereby producing a group of third sets of MCSs; and

after producing the group of third sets, selecting, from the

10   optimal second set and for the second user, a second optimal MCS corresponding to one of the group of third sets that allows the highest maximum data rate for the third user.

3. The method of claim 1, further comprising:

15   determining a last set of MCSs that produces the maximum data rate for a last user; and

selecting as a last optimal MCS for the last user the MCS from the last set that minimizes a required power.

20   4. The method of claim 1, further comprising

determining one of the available resource constraints from a maximum number of codes available for use.

5.   The method of claim 1, further comprising

determining one of the available constraints from a maximum

transmit power that can be allocated.

5   6.   The method of claim 1, wherein determining the first set of MCSs

comprises eliminating any MCS that requires more transmit power than can be

allocated.

7.   The method of claim 1, wherein determining the first set of MCSs

10   comprises eliminating any MCS that requires more codes than are available.

8.   A scheduler for selecting a modulation and coding scheme (MCS) to be used when sending messages in a wireless communication system, the scheduler comprising:

a processor for controlling the scheduler;

5   a memory coupled to the processor and comprising executable instructions and data for programming the processor; and

a system interface coupled to the processor for interfacing the processor with the wireless communication system,

wherein the processor is programmed to:

10   determine a first set of MCSs, each of which produces a maximum data rate for a first user, in accordance with available resource constraints of the wireless communication system;

form, for each MCS of the first set, a second set of MCSs that produces the maximum data rate for a second user in accordance with a first residual

15   resource that remains when applying that MCS to the first user, thereby producing a group of second sets of MCSs; and

after producing the group of second sets, select from the first set and for the first user, a first optimal MCS corresponding to one of the group of second sets that allows a highest maximum data rate for the second user.

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9. The scheduler of claim 8, wherein the processor is further programmed to:

select the one of the group of second sets that allows the highest maximum data rate for the second user as an optimal second set of MCSs for the second user;

form, for each MCS of the optimal second set, a third set of MCSs that produces the maximum data rate for a third user in accordance with a second residual resource that remains when applying that MCS of the optimal second set to the second user, thereby producing a group of third sets of MCSs; and

after producing the third set, select, from the optimal second set and for the second user, a second optimal MCS corresponding to one of the group of third sets that allows the highest maximum data rate for the third user.

10. The scheduler of claim 8, wherein the processor is further programmed to:

determine a last set of MCSs that produces the maximum data rate for a last user; and

select as a last optimal MCS for the last user the MCS from the last set that minimizes a required power.

11. The scheduler of claim 8, wherein the processor is further programmed to determine one of the available resource constraints from a maximum number of codes available for use.

12. The scheduler of claim 8, wherein the processor is further programmed to determine one of the available resource constraints from a maximum transmit power that can be allocated.

5 13. The scheduler of claim 8, wherein the processor is further programmed to determine the first set of MCSs by eliminating any MCS that requires more transmit power than can be allocated.

14. The scheduler of claim 8, wherein the processor is further programmed 10 to determine the first set of MCSs by eliminating any MCS that requires more codes than are available.

15.   A software program for selecting a modulation and coding scheme

(MCS) to be used when sending messages in a wireless communication system, the

software program, when installed and executed on a processor of the wireless

communication system, causing the processor to:

5   determine a first set of MCSs, each of which produces a

maximum data rate for a first user, in accordance with available resource constraints

of the wireless communication system;

                    form, for each MCS of the first set, a second set of MCSs that

produces the maximum data rate for a second user in accordance with a first residual

10   resource that remains when applying that MCS to the first user, thereby producing a

group of second sets of MCSs; and

                    after producing the group of second sets, select, from the first

set and for the first user, a first optimal MCS corresponding to one of the group of

second sets that allows a highest maximum data rate for the second user.

16.   The software program of claim 15, further causing the processor to:

select the one of the group of second sets that allows the highest maximum data rate for the second user as an optimal second set of MCSs for the second user;

5   form, for each MCS of the optimal second set, a third set of MCSs that produces the maximum data rate for a third user in accordance with a second residual resource that remains when applying that MCS of the optimal second set to the second user, thereby producing a group of third sets of MCSs; and

after producing the group of third sets, select, from the optimal

10   second set and for the second user, a second optimal MCS corresponding to one of the group of third sets that allows the highest maximum data rate for the third user.

17.   The software program of claim 15, further causing the processor to:

determine a last set of MCSs that produces the maximum data

15   rate for a last user; and

select as a last optimal MCS for the last user the MCS from the last set that minimizes a required power.

18.   The software program of claim 15, further causing the processor to

20   determine one of the available resource constraints from a maximum number of codes available for use.

19.   The software program of claim 15, further causing the processor to determine one of the available constraints from a maximum transmit power that can be allocated.

5   20.   The software program of claim 15, further causing the processor, in determining the first set of MCSs, to eliminate any MCS that requires more transmit power than can be allocated.

21.   The software program of claim 15, further causing the processor, in 10   determining the first set of MCSs, to eliminate any MCS that requires more codes than are available.

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